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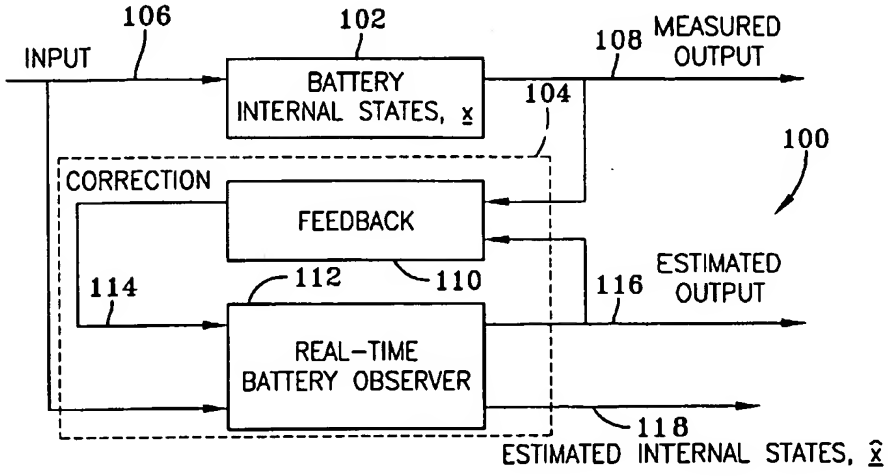
(54) Title: OPTIMAL BATTERY CHARGING FOR DAMAGE MITIGATION



(57) Abstract: A system and method for charging and thus extending the life of an electrical storage device is disclosed. The system provides for developing an essentialized cell model structure of the electrical storage device; determining model parameters for charge-discharge data of the structure; and determining charge-discharge behavior of the structure in a voltage-charge plane. The method also includes measuring voltage values of the structure based upon the charge-discharge behavior; and deriving an instantaneous damage rate from the measured voltage values. The method further includes developing a charging profile based upon the instantaneous damage rate, wherein the charging profile optimizes a charging current with respect to the damage per cycle so as to extend the overall life of the electrical storage device. The method also includes the ability of the system to track the parameters of the electrical storage device as the device changes with time.

WO 2003/103071 A3